



## FIG. 1

### DNA SEQUENCE FOR HUMAN PREPROPARATHYROID HORMONE

10 30 50  
ATGATHCCNGCNAARGAYATGGCNAARGTNATGATHGTNATGYTNGCNATHTGYTTYTN

70 90 110  
ACNAARWSNGAYGGNAARWSNGTNAARAARMGNWSNGTNWSNGARATHCARYTNATGCAY

130 150 170  
AAYYTNGGNAARCAYYTNAAYWSNATGGARMGNGTNGARTGGYTNGMNAARAARYTNCAR

190 210 230  
GAYGTNCAYAAYTTYGTNGCNYTNGGNGCNCNYTNGCNCNMGNAYGCNGGNWSNCAR

250 270 290  
MGNCCNMGNAARAARGARGAYAAYGTNYTNGTNGARWSNCAYGARAARWSNYTNGGNGAR

310 330  
GCNGAYAARGCNGAYGTNAAYGTNYTNACNAARGCNAARWSNCARTRR

M = A OR C

R = A OR G

W = A OR T

S = C OR G

Y = C OR T

H = A OR C OR T

N = A OR G OR C OR T



**TITLE: Production Of Human Parathyroid  
From Microorganisms**  
**INVENTOR: KAARE M. GAUTVIK *et al.***  
**SERIAL NO. 09/668,154**  
**SHEET 2, FIGURE 2**

## FIG. 2

DNA SEQUENCE FOR HUMAN  
PREPROPARATHYROID HORMONE IN PLASMID pSSHPTH-10

10	30	50
TATGATGATACCTGCAAAAGACATGGCTAAAGTTATGATTGTCATGTTGGCAATTTGTTT		
70	90	110
TCTTACAAAATCGGATGGGAAATCTGTTAAGAAGAGATCGTGGAGTGAAATACAGCTTAT		
130	150	170
GCATAACCTGGGAAAACATCTGAACTCGATGGAGAGAGTAGAATGGCTGCGTAAGAAGCT		
190	210	230
GCAGGATGTGCACAATTTTGTGGCCCTTGGAGCTCCTCTAGCTCCCAGAGATGCTGGTTC		
250	270	290
CCAGAGGCCCCGAAAAAAGGAAGACAATGTCTTGGTTGAGAGCCATGAAAAAAGTCTTGGA		
310	330	
GAGGCAGACAAAGCTGATGTGAATGTATTAATAAGCTAAATCCCAGTGA		



## FIG.3

PORTION OF DNA SEQUENCE OF THE PLASMID  
FOR INSERTION INTO E. COLI, CODING FOR HUMAN  
PREPROPARATHYROID HORMONE WITH FLANKING SEQUENCES.

```
      10              30              50
TATGATGATHCCNGCNAARGAYATGGCNAARGTNATGATHGTNATGYTNGCNATHTGYTT

      70              90              110
YYTNACNAARWSNGAYGGNAARWSNGTNAARAARMGNWSNGTNWSNGARATHCARYTNAT

      130             150             170
GCAYAAYYTNGGNAARCAYYTNAAYWSNATGGARMGNGTNGARTGGYTNGMNAARAARYT

      190             210             230
NCARGAYGTNCAYAAYTTYGTNGCNYTNGGNGCNCNYTNGCNCNMGNAYGCNGGNWS

      250             270             290
NCARMGNCCNMGNAARAARGARGAYAAYGTNYTNGTNGARWSNCAYGARAARWSNYTNGG

      310             330             350
NGARGCNGAYAARGCNGAYGTNAAYGTNYTNACNAARGCNAARWSNCARTRRAAATGAAA

      370             390             410
ACAGATATTGTCAGAGTTCTGCTCTAGACAGTGTAGGGCAACAATACATGCTGCTAATTC

      430
AAAGCTCTATTA
```

M = A OR C

R = A OR G

W = A OR T

S = C OR T

Y = C OR T

H = A OR C OR T

N = A OR G OR C OR T



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**SERIAL NO. 09/668,154**  
**SHEET 4, FIGURE 4**

## FIG. 4

DNA SEQUENCE OF FOR HUMAN PREPROPARATHYROID  
HORMONE IN PLASMID pSSHPTH-10 WITH FLANKING SEQUENCES.

```
      10              30              50
TATGATGATACCTGCAAAAGACATGGCTAAAGTTATGATTGTCATGTTGGCAATTTGTTT

      70              90              110
TCTTACAAAATCGGATGGGAAATCTGTTAAGAAGAGATCTGTGAGTGAAATACAGCTTAT

      130             150             170
GCATAACCTGGGAAAACATCTGAACTCGATGGAGAGAGTAGAATGGCTGCGTAAGAAGCT

      190             210             230
GCAGGATGTGCACAATTTTGTGGCCCTTGGAGCTCCTCTAGCTCCCAGAGATGCTGGTTC

      250             270             290
CCAGAGGCCCCGAAAAAAGGAAGACAATGTCTTGTTGAGAGCCATGAAAAAAGTCTTGG

      310             330             350
AGAGGCAGACAAAGCTGATGTGAATGTATTAAGCTAAATCCCAGTGAAAATGAAA

      370             390             410
ACAGATATTGTCAGAGTTCTGCTCTAGACAGTGTAGGGCAACAATACATGCTGCTAATTC

      430
AAAGCTCTATTA
```

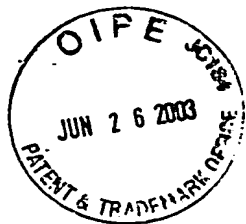


## FIG. 5

DNA SEQUENCE CODING FOR PREPROPARATHYROID HORMONE  
IN pSSHPTH-10 WITH FLANKING SEQUENCES, SHOWING  
THE CORRESPONDING AMINO ACID SEQUENCE OF  
PREPROPARATHYROID HORMONE

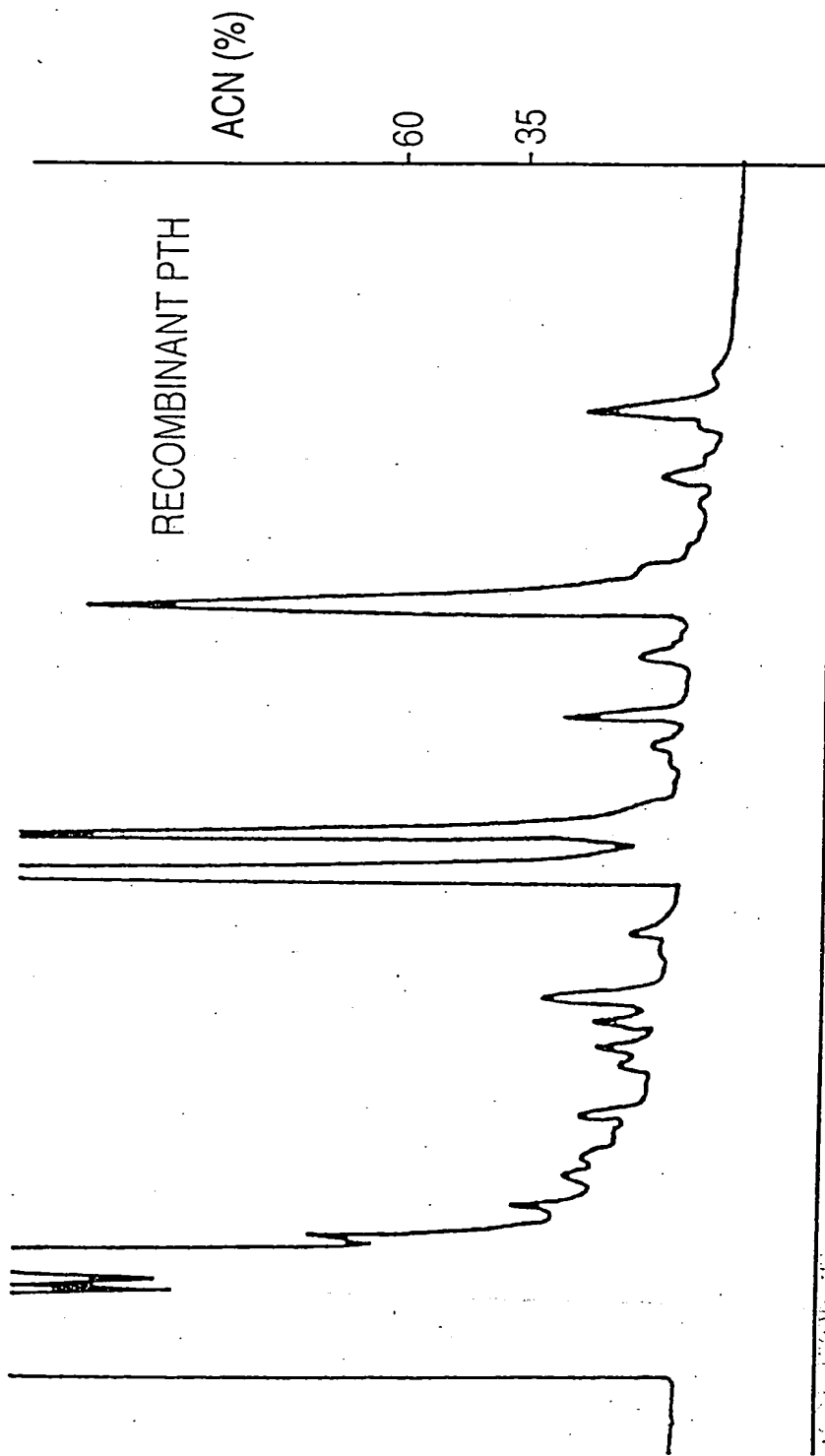
```

      10              30              50
TATGATGATACCTGCAAAAGACATGGCTAAAGTTATGATTGTCATGTTGGCAATTTGTTT
  MetIleProAlaLysAspMetAlaLysValMetIleValMetLeuAlaIleCysPh
      70              90              110
TCTTACAAAATCGGATGGGAAATCTGTTAAGAAGAGATCTGTGAGTGAAATACAGCTTAT
eLeuThrLysSerAspGlyLysSerValLysLysArgSerValSerGluIleGlnLeuMe
      130             150             170
GCATAACCTGGGAAAACATCTGAACTCGATGGAGAGAGTAGAATGGCTGCGTAAGAAGCT
tHisAsnLeuGlyLysHisLeuAsnSerMetGluArgValGluTrpLeuArgLysLysLe
      190             210             230
GCAGGATGTGCACAATTTTGTGCCCTTGGAGCTCCTCTAGCTCCCAGAGATGCTGGTTC
uGlnAspValHisAsnPheValAlaLeuGlyAlaProLeuAlaProArgAspAlaGlySe
      250             270             290
CCAGAGGCCCCGAAAAAAGGAAGACAATGTCTTGGTTGAGAGCCATGAAAAAAGTCTTGG
rGlnArgProArgLysLysGluAspAsnValLeuValGluSerHisGluLysSerLeuGl
      310             330             350
AGAGGCAGACAAAGCTGATGTGAATGTATTAAGCTAAAGCTAAATCCCAGTAAAAATGAAA
yGluAlaAspLysAlaAspValAsnValLeuThrLysAlaLysSerGlnEnd
      370             390             410
ACAGATATTGTCAGAGTTCTGCTCTAGACAGTGTAGGGCAACAATACATGCTGCTAATTC
      430
AAAGCTCTATTA
```



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SHEET 6, FIGURE 9A

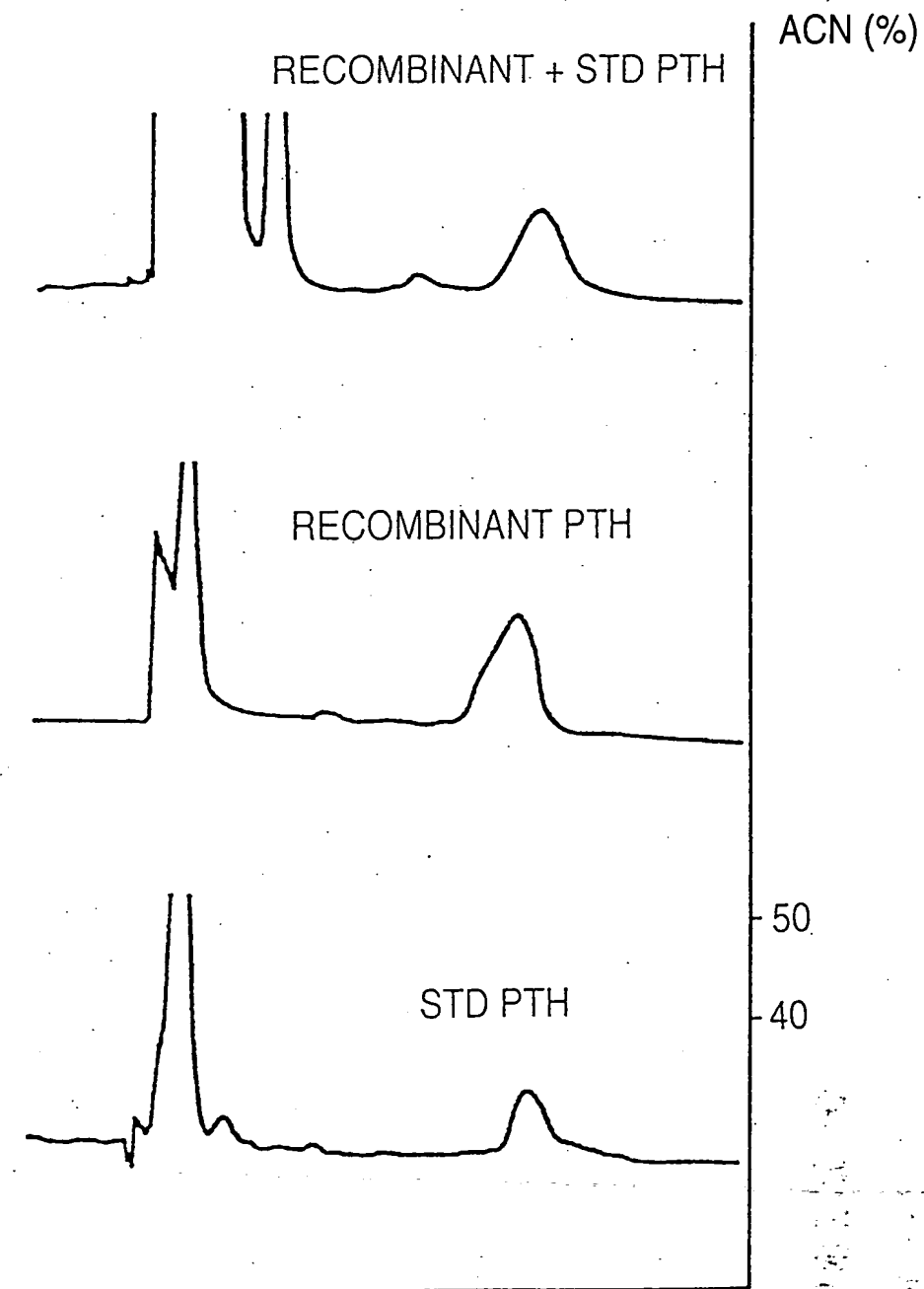
FIG. 9A





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**SHEET 7, FIGURE 9B**

**FIG. 9B**



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FIG. 10A

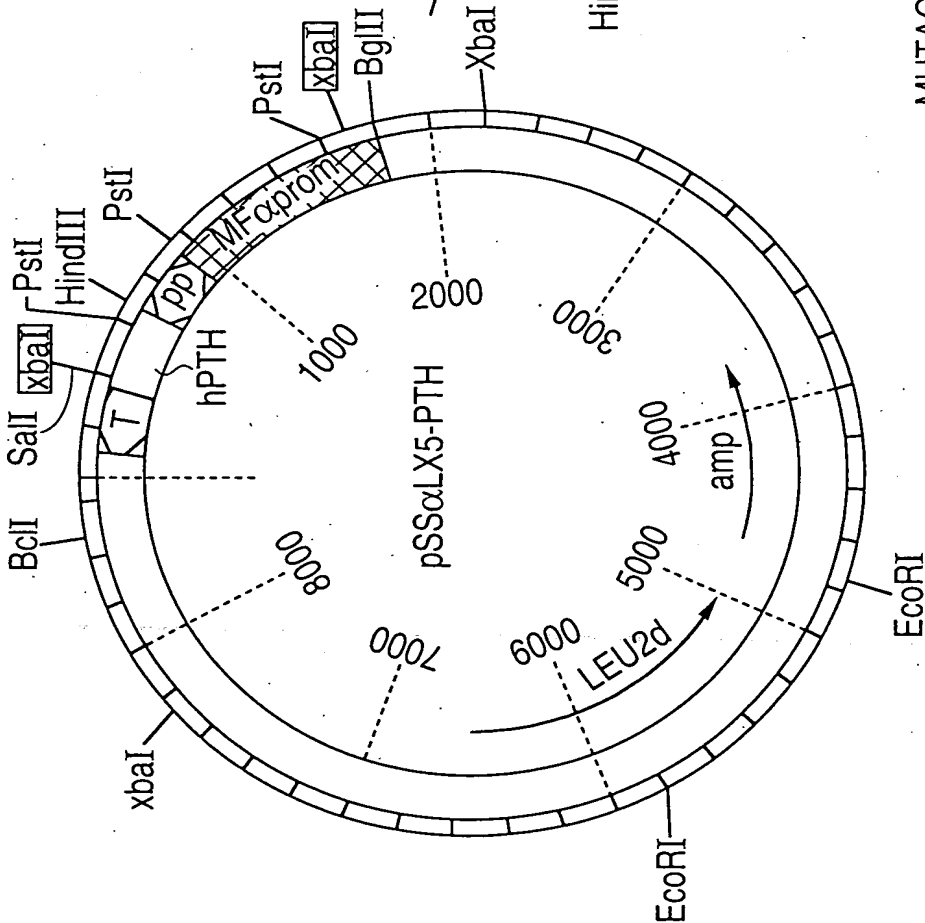
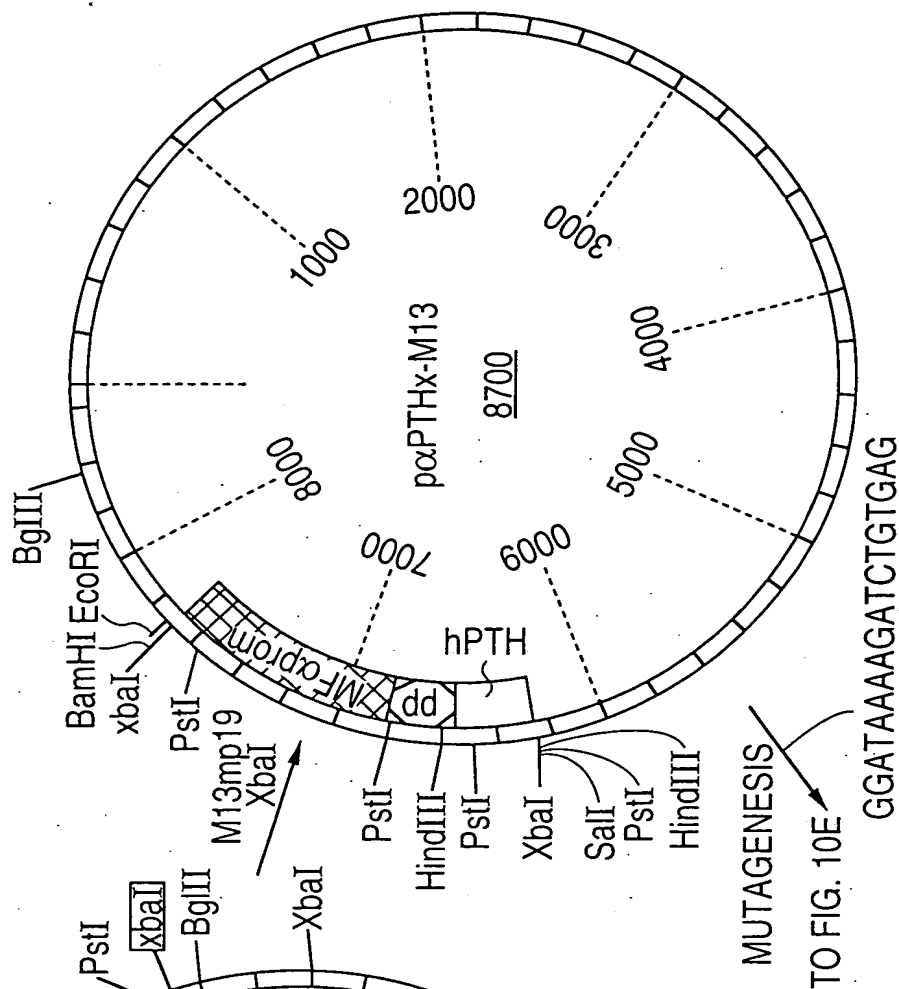


FIG. 10B



MUTAGENESIS

TO FIG. 10E





FIG. 10C

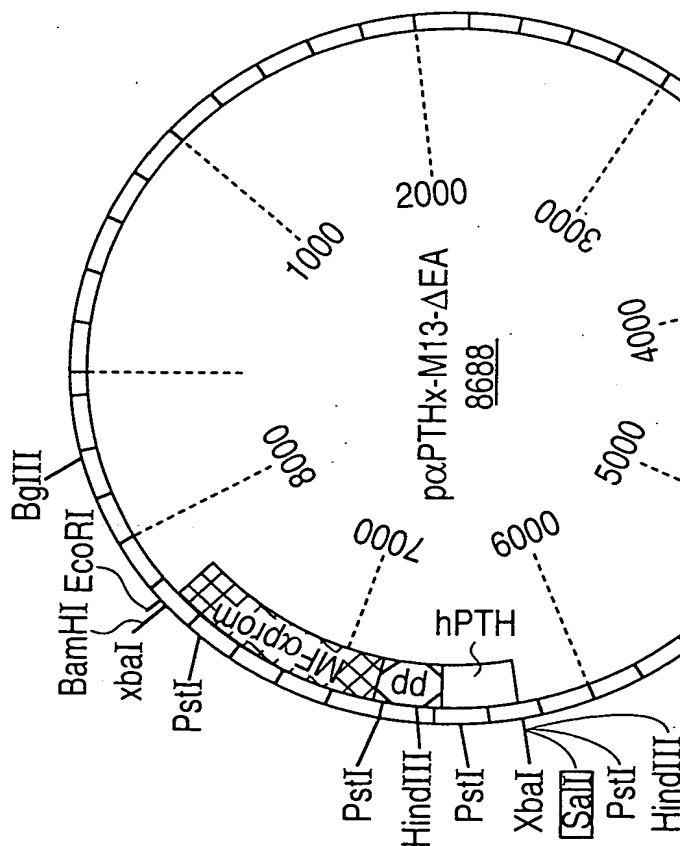


FIG. 10D

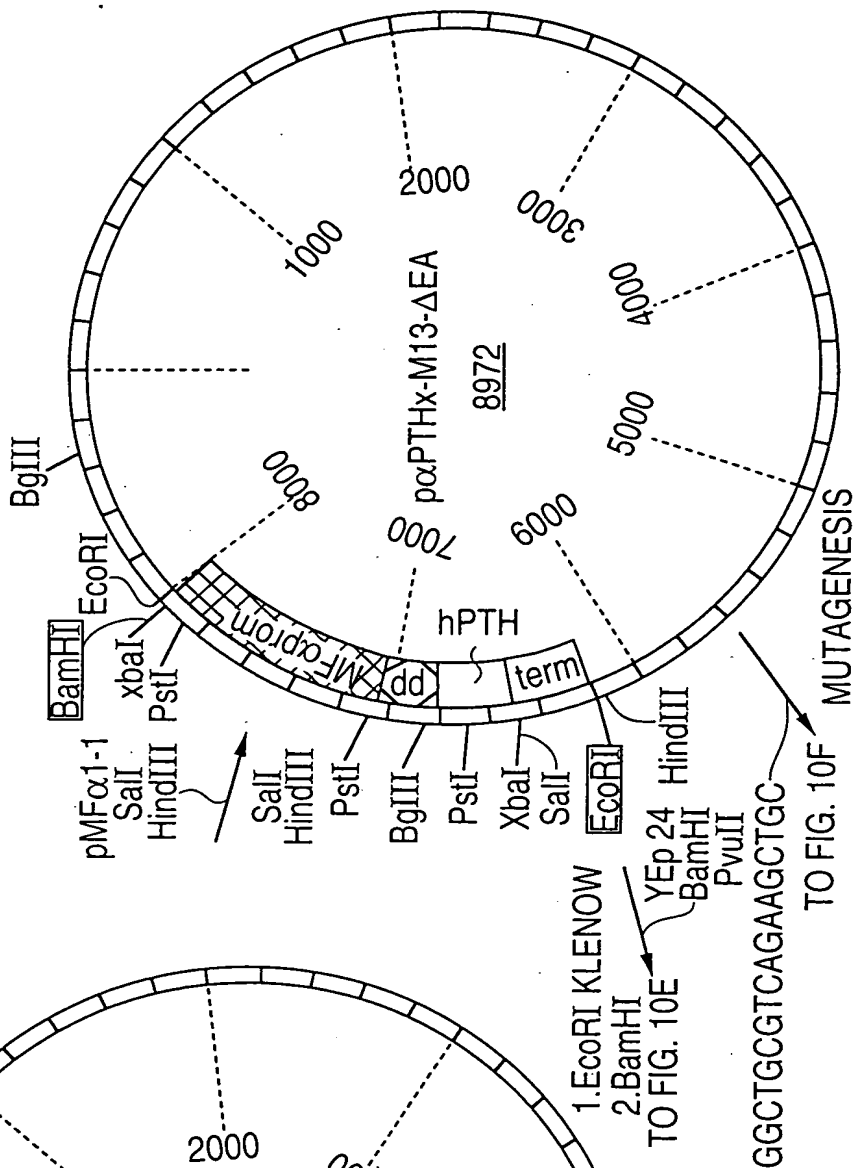


FIG. 10F

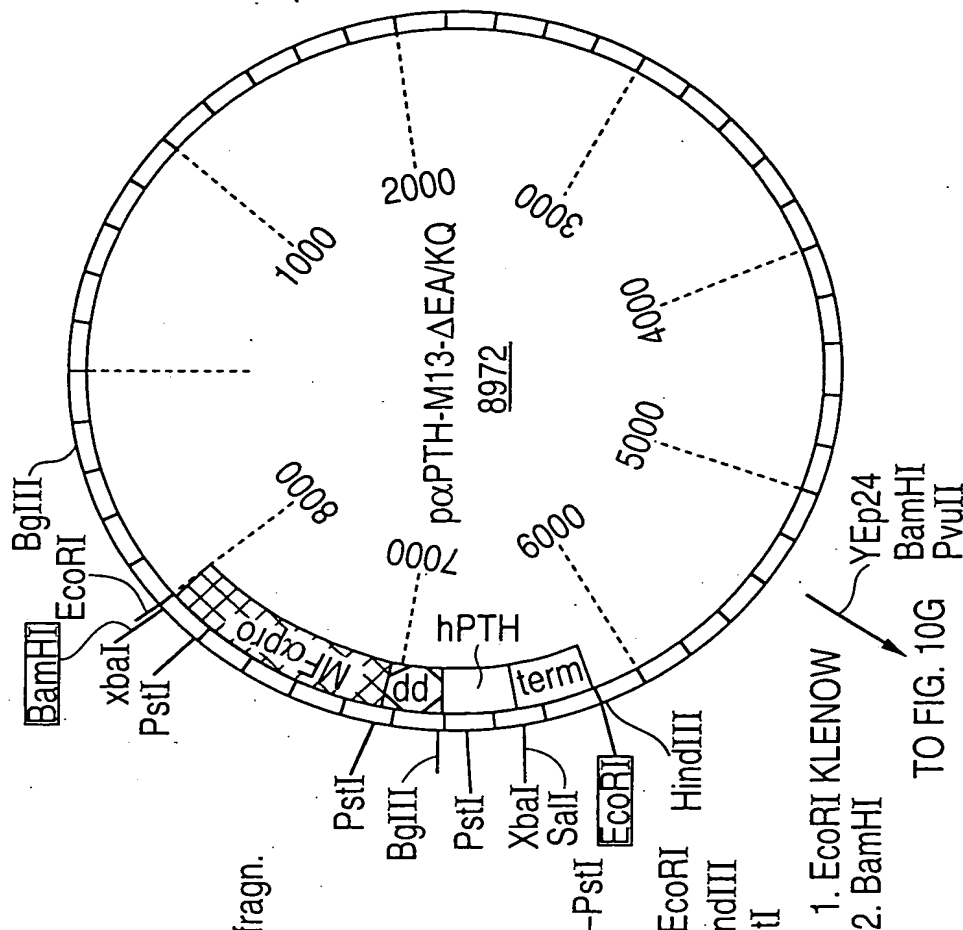
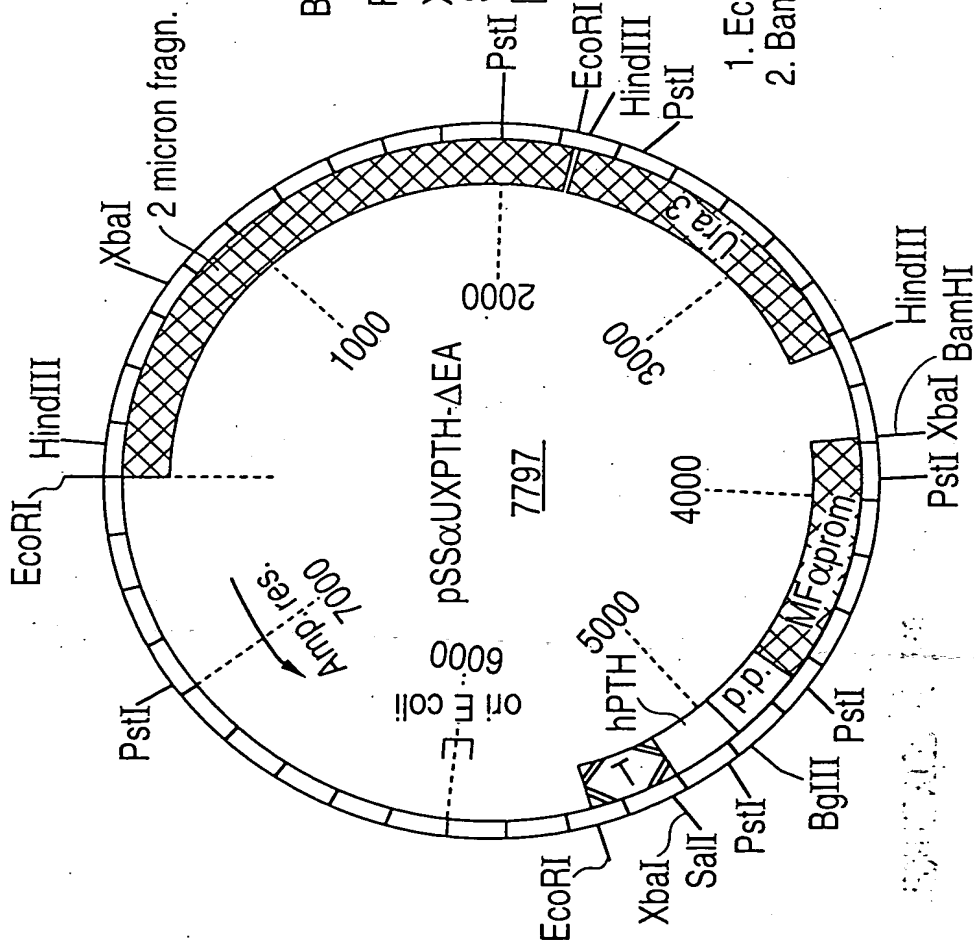


FIG. 10E



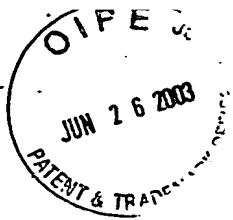
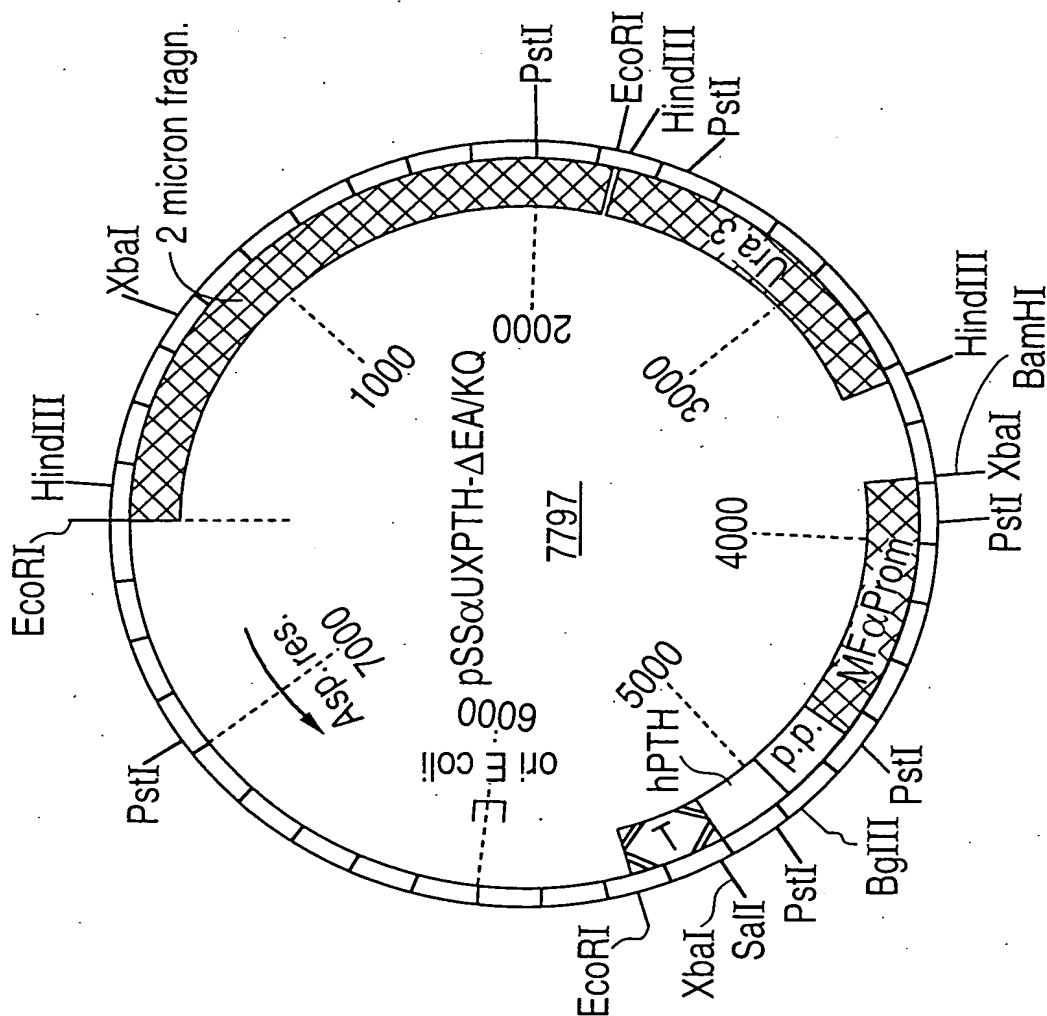


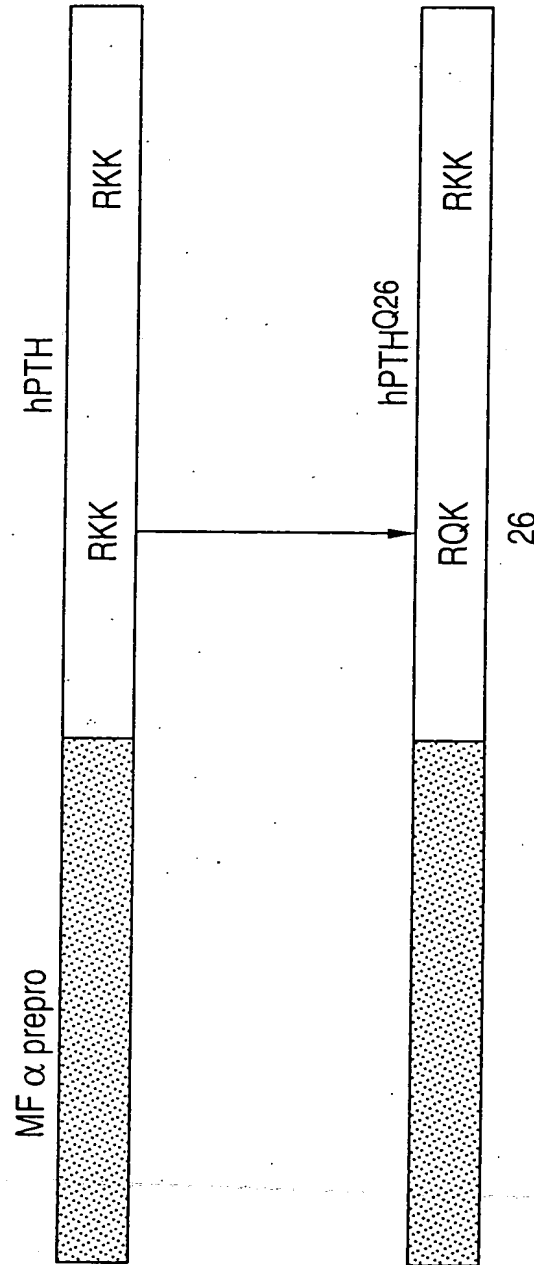
FIG. 10G



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**FIG. 11**

IN vitro MUTAGENESIS OF hPTH





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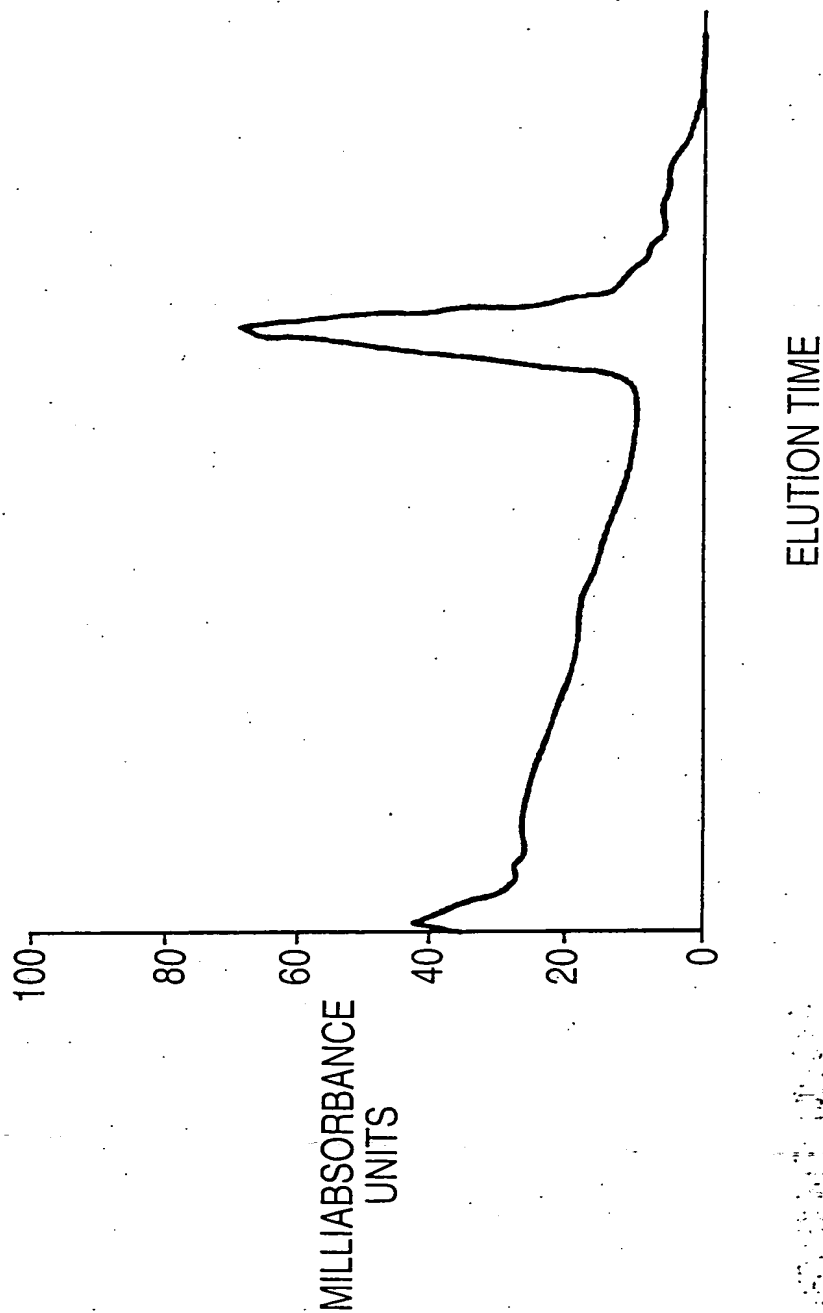
**INVENTOR: KAARE M. GAUTVIK, et al.**

**SERIAL NO. 09/668,154**

**SHEET 13, FIGURE 13A**

**FIG. 13A**

HPLC CHROMATOGRAM OF hPTH (Q26)





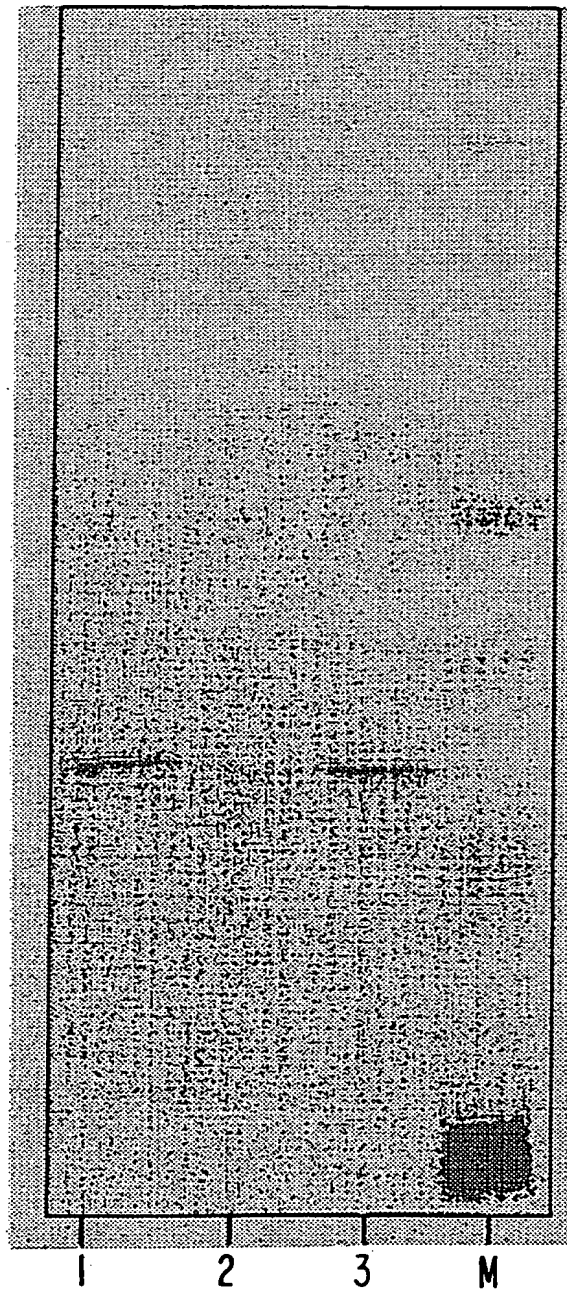
**TITLE: Production Of Human Parathyroid  
From Microorganisms**

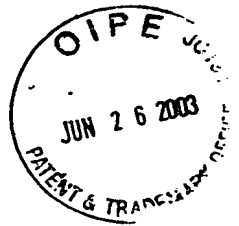
**INVENTOR: KAARE M. GAUTVIK, a**

**SERIAL NO. 09/668,154**

**SHEET 14, FIGURE 13B**

**FIG. 13B**





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SHEET 15, FIGURE 14

FIG. 14

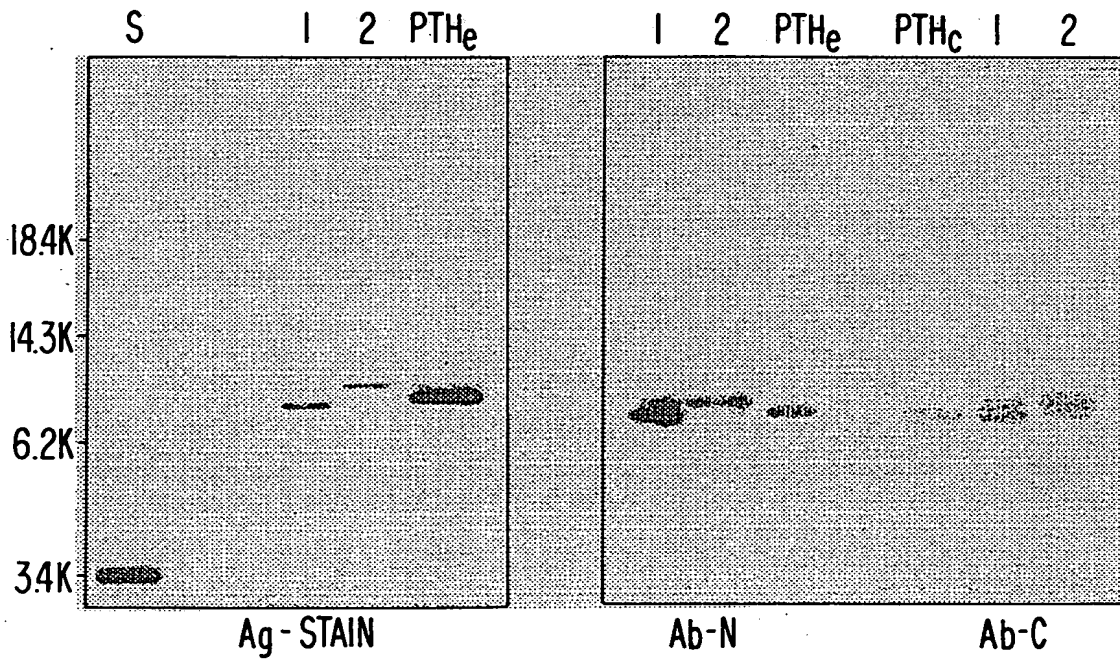




FIG. 15

